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SAFETY POSTERS AT THE CALUMET & HECLA MINES

BY

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SAFETY POSTERS AT THE CALUMET & HECLA MINES[1]

By F. S. Crawford[2]

It has been said that safety promotion passes through four stages--the band-playing, the machine-guarding, the protective equipment, and finally the educational stage; the last is the most important in the development of the safety program.

It has been estimated that only 15 percent of accidents can be prevented by machine guarding and protective equipment; the other 85 percent must be stopped by the safety efforts of the individual workers and their supervisory officials, and one of the fundamentals of safety work is the education of workers to develop safety consciousness or safety mindedness.

One way of educating men to think about safety is by the use of posters. Safety engineers at the Calumet & Hecla mines in Michigan have been conducting a safety contest among the men by the use of posters of an unusual type in addition to those usually employed to illustrate bad practices and to display the number of days without a lost-time accident.

The first requisite for the success of the safety poster is a good artist or draftsman; in the poster contest instituted at the Calumet & Hecla mines two sheets were prepared illustrating various conditions in the slope workings, including a large number of unsafe practices. The object of the contest was to get the men to think about safety through criticism of the unsafe conditions displayed on the posters. The following notice accompanied the posters:

PICTURE PRIZE CONTEST

> The contest consists of finding the poor practices shown in the two pictures. Try to find all the poor practices you can--make your answers short. There may be several things wrong in one place. Each man in the pictures is named so that you may be able to tell where the poor practice is.

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[1] The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular 6827."

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An easy way to cover the picture is to start with one man--say it is sheet no. 1--then start with Joe--look over this place--note the poor practices. Then take Bill--note all poor practices, etc., until the picture is covered--then look over the other picture in the same manner.

A sample sheet follows:

No. 1 sheet.   Henry Jackson.   No. 4 Calumet

1. Joe--Drilling near missed hole.

2. Joe ______.

3. Bill ______.

No. 2 sheet.

1. Henry _____.

2. Pat _____.

(Fold your paper and place in your check box.)
SAFETY DEPT.

The contest was initiated by posting this general notice with sheets 1 and 2 (see figs. 1 and 2) in the various change houses, locally termed "drys." The men gathered about the bulletin boards to discuss the posters but did nothing about them until a man from the safety department showed them how to proceed. It was decided, therefore, to hold a contest in only one "dry" at a time and to have a safety man present each day when the men came off the shift.

The value of the contest in developing safety consciousness is indicated by the reaction of the men; those who could not write English but could write the language of their fatherland took notes and had their children write the papers for the contest; those who could not write took their children to the "dry", pointed out the unsafe practices, and had them write the criticisms.

After the contest had been in progress for some time, the safety engineers felt that it would be better to include a large number of safe practices with the unsafe ones in order that the minds of the men would not be dwelling upon unsafe practices alone; this is in accord with psychology which stresses the point that to correct an unsafe practice attention should be focused on the proper or standard method of procedure. It is also in line with the belief that too many "don'ts" are not so effective without corresponding "do's" to indicate the correct methods.

These posters have been useful also in pointing out the hazards to new employees and have been particularly valuable in showing new hoisting engineers underground conditions.

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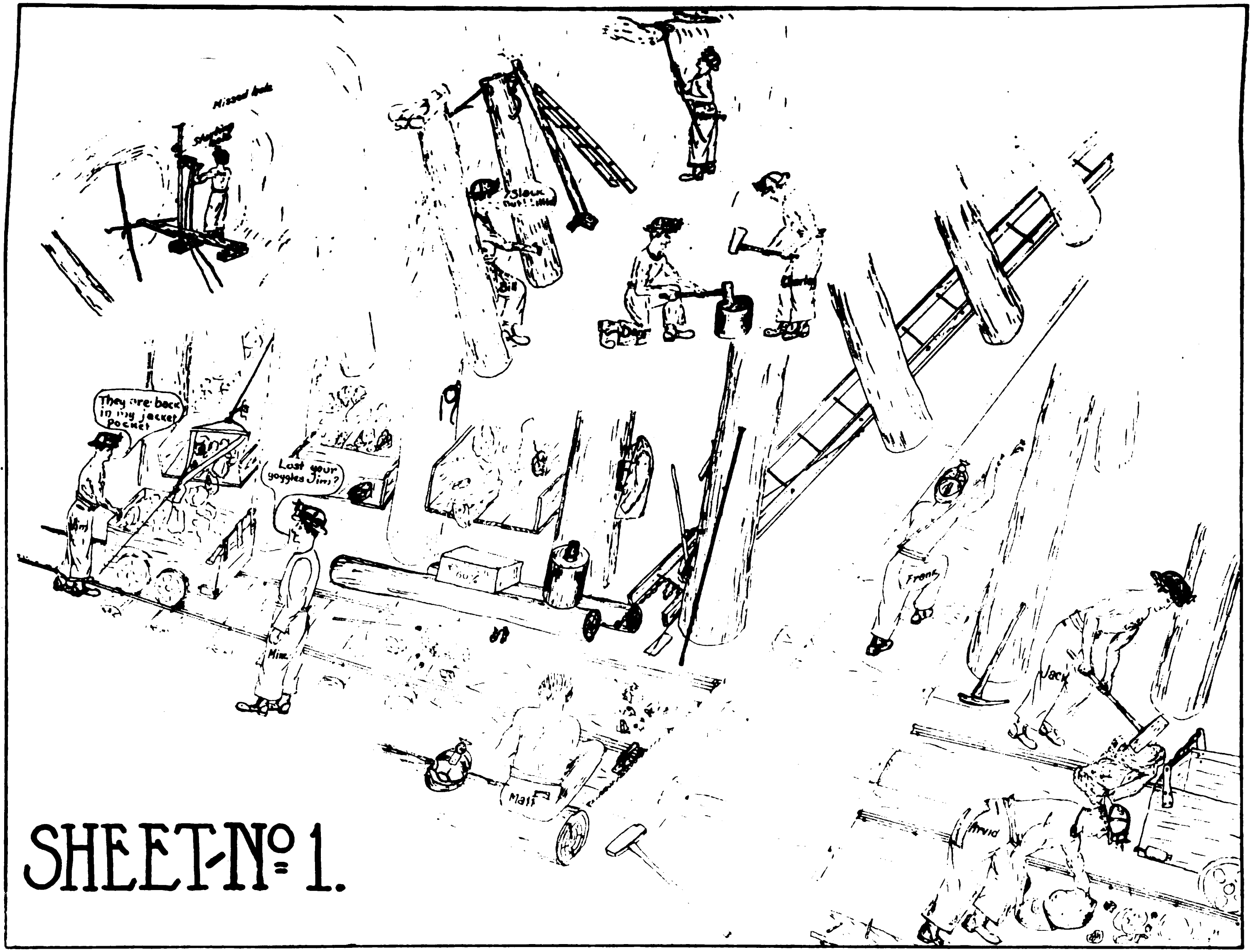

Figure 1.—Poster 1 illustrating poor practices for prize contest, Calumet & Hecla mines.

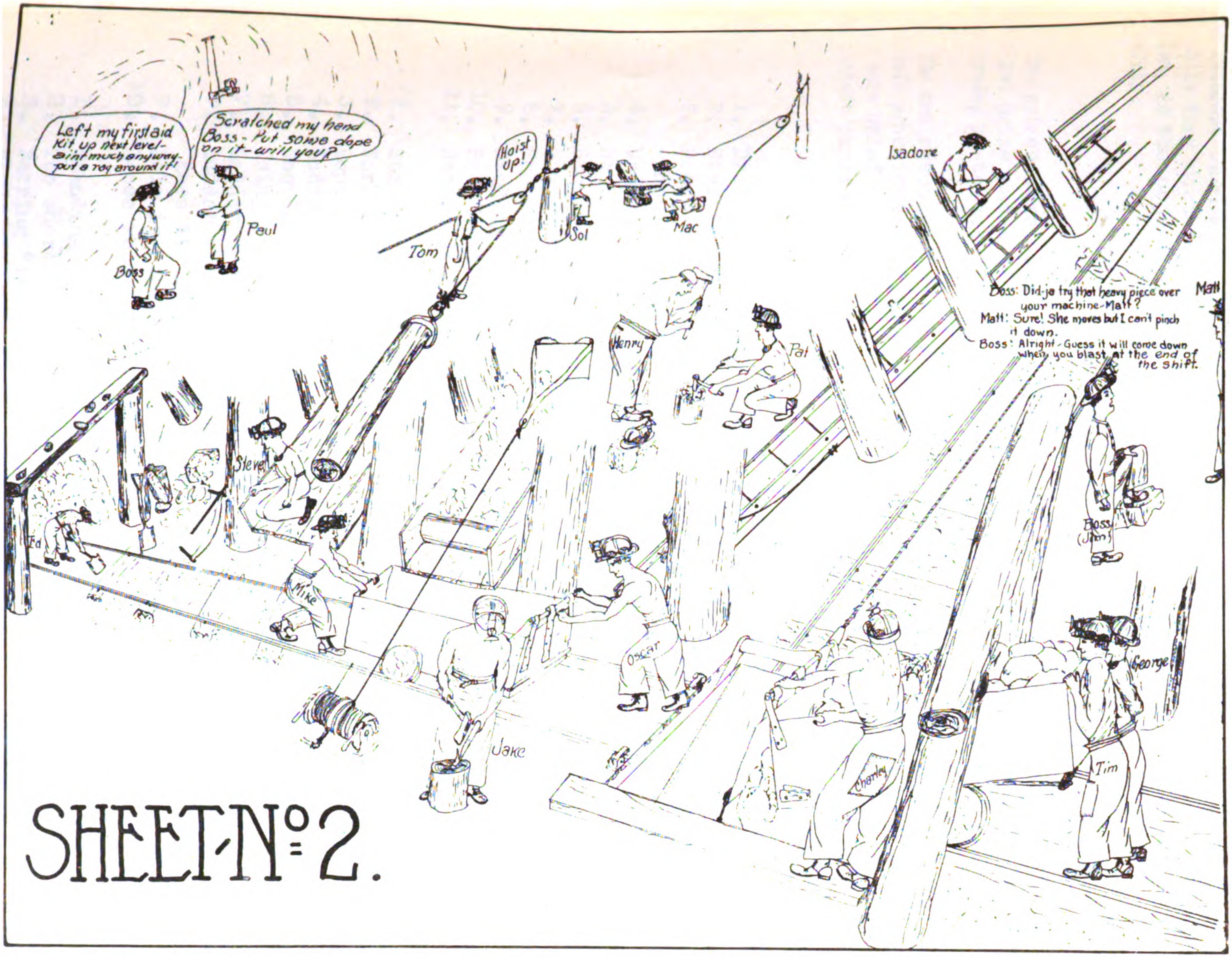
Left my firstaid Kit up next level- aint much anyway- put a rag around it!
Scratched my hand Boss - Put some dope on it - will you?
Boss
Paul
Hoist up!
Tom
Sol
Mac
Isadore
Boss: Did-ja try that heavy piece over your machine-Matt?
Matt: Sure! She moves but I can't pinch it down.
Boss: Alright - Guess it will come down when you blast at the end of the shift.
Matt
Henry
Pat
Steve
Ed
Mike
Boss (Jim)
Oscar
Jake
Charley
George
Tim
SHEET Nº 2.

Figure 2.—Poster 2 illustrating poor practices for prize contest, Calumet & Hecla mines.

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It was found essential to the success of the contest for one of the safety engineers to be present to induce all of the men to compete. The less-educated men usually thought they had no chance but entered the contest with interest when told that they could bring their children to do the writing while they dictated the answers or criticisms. This solved a baffling problem, as the object of the contest was to get all of the men to thinking of safety.

PRIZES

Two prizes were offered at each shaft for the best set of criticisms; the first prize was a pair of high-top mining shoes and the second prize a high-grade, up-to-date, hard or safety hat.

The men responded so well that a number of the papers called attention to unsafe practices unintentionally illustrated in the posters. The criticisms were brief and pointed, as is indicated by the following summary of the contest papers.

SHEET 1

JOE:

1. Drilling near missed hole.
2. Starting hole without goggles.
3. Poor stage plank; has a bar and drill and is tied with rope--should be tied with chain.
4. Using a pinch bar for stage support.
5. No collar under arm or machine post.
6. Should blast missed hole before drilling.
7. Should pass hose over stage plank, not under.
8. Should not use bar to build stage.
9. Staging pipe ready to fall.
10. Poor knot on staging.
11. Has no jack bar.

BILL:

1. Standing under log while "slacking out."
2. Working under man barring "loose."
3. Rope partly broken.
4. Ladder should not be left against heaving pole.
5. Should use a chain and not tongs.
6. Using only single rope.
7. Ladder has broken stave.
8. Ladder with iron staves should have tie bolt on each end to keep it from spreading apart.
9. Pole is poorly wedged in the bottom.
10. Loose rock overhead.

MARTIN:

1. Standing under "loose" while barring.
2. Too short a hold on bar.
3. Barring "loose" while men are working below.
4. Hands too close to heel of bar.
5. Thumb up along bar.
6. Does not warn others to stand clear.

DAN:
1. Should be wearing goggles.
2. Using ax for a wedge.
3. Has slivers on ax handles.
4. Should not strike toward his pal.
5. Kneeling in front of his partner's ax.

CHARLEY:
1. Should be wearing goggles.
2. Dan and Charley should use wedges for splitting.
3. Dan and Charley working under man barring "loose."
4. Dan and Charley striking on ax with another ax.
5. Should report poor skip rope to boss.
6. Dumper should be opposite shaft.

FRANK:
1. Should take ladder road instead of shaft.
2. No goggles.
3. May have flint in lamp lighter; wearing a shirt provides some protection. Mike is the only man wearing a shirt.
4. Climbing through shaft with drills.

JACK:
1. Sledging rock without goggles on.
2. Sledge hammer cracked.
3. Striking rock on rail.
4. Breaking rock near partner without warning him.
5. Pick handle loose and split; pick dull.
6. Pick should go to smith shop; broken head.
7. No dumping irons on rails. Holding car from going into skip without irons; may come back and break legs.
8. Slivers on jackhammer handle.
9. Should not use sledge hammer--should use pick.

ARVID:
1. Lifting cracked rock--might break and fall on foot.
2. Should wear goggles while partner is sledging.
3. Should pick up one rock at a time.
4. Should turn down two spikes in the plank on side.
5. Should not have back to the shaft--should be facing other way.
6. Should bend nails over on plank.
7. Should not lift cracked rock.
8. Pick leaning against log; poor handle and head on it.
9. Lifting in wrong position.
10. No bumpers on rails by shaft.
11. Car off track.
12. Strands on cable in back of scraper.
13. Sliver on timber close to lever.
14. No stoppers on rails.

MATT:
1. Sledge head cracked.
2. Not wearing hard hat.
3. Sitting too near shaft; rock might come down and strike him.
4. Drill leaning against timber by shaft.
5. Chain on rung of ladder road.
6. Log obstructing ladder road.

7. Pail and coat hanging in ladder road.
8. Rocks lying in middle of plat at shaft.
9. Rocks not cleaned from track.
10. Mill left open--chute stopper not in.
11. Box of powder under chute.
12. Fuse and cap hanging on timber.
13. Bell lever should be tied up.
14. No dumping iron on foot side rail by shaft.
15. Dirty track.
16. Drill lying on track.
17. Lever not hung.
18. Pick handle split and loose; one end broken.
19. Water can in poor place.
20. Hammer has a poor face.
21. Spikes sticking up in plank and timbers.
22. Hoop iron used for lever hinges instead of a chain.
23. Bell branch-line connection weak.
24. Should not have strap iron for bell lever hanger.
25. Timber lying too close to shaft.
26. Bell lever without any slide on it.
27. No bumper on foot side rail by shaft.
28. Log too near shaft.
29. No dumping irons on north side of shaft and only one on south side.
30. First chute not blocked.
31. Tools should be laid down, not lying against timber.
32. Shiner is off.
33. Water can has grip in poor place.
34. Rock jumped over crosspiece in chute no. 2--ready to fall.

MIKE:

1. Rock lying on edge of chute outside stopper.
2. Standing in front of mill while men are working overhead.
3. Drill lying in center of track.
4. Car should be blocked with a piece of wood, not with a rock.
5. Should not stand in front of chute; loose rock in front of chute should be taken away.
6. Chute should be blocked up; dirt may roll down.
7. Water can should not be on top of logs.
8. Drill should be taken away from timber so it won't fall in shaft.
9. Track should be cleaned up.
10. Loose wire rope on scraper may cut finger on hand.
11. Sledge is poor--should go to smith shop.
12. Has no goggles around his neck.
13. Should remove spike from chute timber.
14. Should remove cap and fuse hanging on log over chute.
15. Timber out past the end of ladder.
16. Chain thrown over ladder stave.
17. No stopper on gate in chute opposite Mike.
18. Rocks coming down open chute may cause an explosion.

19. Foot in way of skip.
20. Lever should be cleaned.
21. Drills should be put in a rack.
22. Bumper on rail by shaft; north side, foot rail.
23. South side, hanging side rail.
24. South side, foot rail.
25. Primer on timber near powder.
26. Should have clear level.

JIM:
1. Should wear goggles on hat or neck.
2. Hand inside car while scraper is working.
3. Standing too near mill while scraper is working.
4. Scraper rope frayed--should be trimmed or tied.
5. Poor block under car wheel.
6. Arm bleeding, should be taken care of.
7. Standing too close to car.
8. Should tie ends of all cables.
9. Should use wedge, not rock, to block car.
10. Should not have a knot with long tail--wire rope, use a hook.
11. Bell line should be hung up when not in use.
12. Pull rope should be spliced.
13. Long tail on scraper rope.
14. "Powder" under chute.
15. Rock under wheel instead of wooden block.

SHEET 2

BOSS:
1. Should be carrying his first-aid kit.
2. Should not tell Paul to use rag to bandage cut.
3. Should insist on "loose" being propped or blasted at once.
4. Has no goggles.
5. Giving poor advise.
6. Should consider small cuts serious, as well as big ones.
7. Should make record of accident.

PAUL:
1. No goggles.
2. Evidently no first-aid box on level.
3. Wears poor shoes.
4. Should not put rag on scratch.

TOM:
1. Standing in front of block while hoisting.
2. Keeping hand on rope while hoisting.
3. Should use a chain, not tongs, in hoisting log.
4. Should not stand in front of tongs.
5. Wears poor shoes.
6. No guard on trigger.
7. Standing inside rope circle.
8. Hoisting log with broken rope.
9. Should wave a light, not call for signals.

MAC:
1. Hand too near saw while cutting piece.
2. Has no goggles.
3. Should not work below scraper pole.

SOL:
1. Has no goggles.
2. Sol and Mac should not cut timber where scraper is running.
3. Has his hand on rope.
4. In angle of blocks.

GEORGE:
1. Needs new hat.
2. Stands too close to car.
3. Should keep hands below car.
4. Broken wire on skip rope.

JIM:
1. Safety clutch not released on car while dumping.
2. Hand on top of rear door while dumping.
3. No goggles around his neck.
4. Stands too close to car while dumping it.
5. Wearing a shirt gives some protection. Only two bosses are wearing shirts.
6. Dumping-car safety clutch out of commission.

CHARLEY:
1. Hand inside car while dumping.
2. Should not be on bridge.
3. Strip rope frayed.
4. Bell should be locked while dumping.
5. Hand on bar of car.
6. Should not be at back of shaft.
7. Safety catch tied down; car might come back and break someone's legs.

ISADORE:
1. Should wear goggles while striking pipe.
2. Should not use hammer on pipe.
3. Should carry wrenches if he intends to fix pipe.
4. Pipe line should be lower.

MATT:
1. Should prop or blast loose rock.
2. Should blast heavy piece of ground before he does any more work.

BOSS JIM:
1. Gives Matt wrong orders.
2. Boss and Matt use poor judgment.
3. Should not permit man to work under loose ground during shift.
4. Should order Matt to bar "loose"; should prop or blast "loose" at once.

HENRY:
1. Hat should be on his head.
2. Should be wearing goggles.
3. Striking with an ax.
4. Rail-cutter head broken.
5. Should not face his partner while striking.

6. Striking on a poor chisel.
7. In front of partner's ax.
8. Shiner off.

PAT:
1. Should be wearing goggles.
2. Rail-cutter head chipped or cracked.
3. Ax is a poor tool for striking cutter--use hammer.
4. Using wood to cut rope on.
5. Loose chain on pole.
6. Should not stay in front of a man striking.

CSCAR:
1. Feet too near shaft--might slip.
2. Hands outside car bar while pushing.
3. Using drill for car-door bar.
4. No goggles around his neck.
5. Should be on the side of car, not in front of car so close to shaft.
6. Poor shoes.

MIKE:
1. Walking backward pulling car.
2. Pulling car past open mill.
3. No goggles around his neck.
4. Should not go below chute while timber is hoisted.
5. Hand on car while it is being filled.
6. Scraper engine has no guard in front of it.

JAKE:
1. Chopping toward knee.
2. Holding piece wrong--thumb in danger.
3. Working too near shaft.
4. No goggles.
5. Making wedges.
6. Slivers on ax handles.
7. Chopping in front of chute where scraper is going.

STEVE:
1. Under timber being hoisted.
2. No stopper in chute.
3. Saw not in safe place.
4. Drill not in safe place.
5. Should not be in chute while timber is hoisted.
6. Wears poor shoes and hat.
7. Leaning saw and drill against log with loose rock behind.

ED:
1. Working under cap piece covered with loose rocks.
2. Working in front of open mill--full of loose rocks.
3. Shovel handle cracked.
4. Should clean rocks off cap piece.
5. Should take crosscut saw and drill from timber.
6. Should throw down rocks from behind timber.
7. Saw and drill in poor place.
8. Tugger engine in poor place.
9. Should roll down rock standing against timber.
10. Should roll rocks ready to come down from stopes.

11. Shovel has sharp points on blade.
12. Shovel leaning on log; loose rock behind log.
13. No guard on crosscut.
14. Didn't take loose rocks off wall plate.
15. Saw should have guard on, with teeth facing down, or should be put in safe place.
16. Rocks hanging in mill should be rolled down to level.
17. Loose rocks on wall plate and rock leaning on leg.

BULLETIN BOARDS

Another feature of the safety-poster work at the Calumet & Hecla mines is the plan for showing the cumulative no-lost-time accident record on the bulletin board. The bulletin boards are located inside each change house and consist of three frames. National Safety Council and Elliott Service posters occupy the two outside frames, while the middle one contains a sketch made locally showing an unsafe practice resulting disastrously, with a warning attached. At the top of the poster is a large figure showing the number of days the shaft has run without an accident. The posters are made up in sets up to 200 days; at first the sets from 1 to 10 days are used more frequently. When a shaft has a lost-time accident it has to start again and is given a different series of posters which have not been used before at that shaft. The posters are changed twice a week; if no accidents have occurred the figure may jump from 10 to 14 days when the posters are changed. Thus, one set of posters may be used again and again at one shaft if the record is broken by an accident and it becomes necessary to repeat.

CONCLUSION

The educational phase of safety is constantly stressed by the Bureau of Mines, but the Bureau does not minimize the value of guarding machinery and the use of protective clothing and equipment. The so-called band-playing stage also occasionally has value in stirring up enthusiasm. For steady year-round safety work, however, education of each individual workman ultimately gives the best results in reduction of accidents, and the safety posters shown in this paper offer a good method of approach, although it is realized that not all mining companies have available an artist of the type available to the Calumet & Hecla Co. for this very excellent educational safety work.